

Differences in the health systems responsiveness in townships with different economic levels, and the role of general practitioners

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Abstract

Background

The evaluation of health system responsiveness (HSR) can improve patient satisfaction, promote health equity and improve the quality of health services. There are many factors affecting HSR, but in view of China's national conditions, economic inequality and the promotion of general practitioners. Our research explored these two aspects.

Methods

Using a multi-stage stratified sampling method, 820 participants aged 18 and over were extracted in Kunshan City, China. Analysis of Variance was used in preliminary analysis. Linear regression was applied to explore the association of people in different economic towns with HSR score. The moderating effect of general practitioners was analyzed using Model 1 in Macro PROCESS program.

Results

Among the participants in the study, reported that mean (SD) HSR score was 34.7 ± 4.29 . The association between the economic development level of towns and HSR was significant even after adjustment ($\beta = -0.42$; 95% Confidence Intervals, CI = $-0.69-0.15$; $p = 0.002$). In addition, hospital level ($\beta = 0.75$; 95% CI = $0.34-1.15$; $p < 0.001$) and whether general practitioners are contracted ($\beta = 2.61$; 95% CI = $1.81-3.41$; $p < 0.001$) were also important factors affecting the HSR score. Moderating effect analysis showed that general practitioners significantly moderated the effect of economic level on HSR score ($P = 0.01$).

Conclusions

Economic development level of towns was negatively correlated with the increase of HSR score. People in towns with good economic development level may have lower HSR scores. At the same time, general practitioners moderated the impact of economic development level on HSR score.

1. Introduction

Health system responsiveness (HSR) is defined as the responsiveness of health systems to the legitimate expectations of populations regarding how they are treated[1]. Well HSR is essential for the provision of high-quality health services. As early as 2000, the World Health Organization (WHO) has regarded improving HSR as one of the three intrinsic goals that must be achieved to comprehensively improve the health system[2]. HSR focuses on the nonclinical aspects of the quality of the health system including autonomy, choice, clarity of communication, confidentiality, dignity, prompt attention, quality of basic amenities, and access to family and community support [3]. This is very important for patients'

satisfaction with the health care system. Patient satisfaction is an important indicator of the quality of care provided, which can reflect the fairness of health services to a certain extent[4]. Therefore, the HSR evaluation is equivalent to the inspection of the health system. According to the inspection results, it can improve patient satisfaction, promote health equity and improve the quality of health services.

According to the research, there are many factors affecting the HSR, including residence in rural or urban areas, community health workers or specialists, the distance from the nearest health care facilities to home and so on[5, 6]. Not unexpectedly, in some studies, it has been pointed out that economic level is related to health system responsiveness. A study involving 32 countries including England, Germany and Denmark showed that countries that spend more on health services are associated with higher levels of HSR, especially in dignity and autonomy[7]. A study from India also showed that differences in economic levels affect the HSR[8].

China has enjoyed great economic and social progress during the past decade. However, this rapid economic growth will also be accompanied by the increase in economic inequality. This economic inequality will also affect the health system. We should pay attention to the health inequality caused by this economic difference. A study in China that did not include the hospital level as the control variable also showed that HSR was related to the regional economic development level[9]. There has been a lack of comprehensive research on the responsiveness of the health system in China recently.

In 2016, the Chinese government fully implemented the general practitioner signing system. Through the general practitioner contract service system, general practitioners provide comprehensive services to help patients who lack professional knowledge to improve their ability to appropriately choose medical institutions and obtain long-term coordinated healthcare[10]. Although the definition and responsibilities of family doctors are not consistent internationally, studies in China and other countries in the world show that general practitioners have made contributions to the health system, including better meeting the needs of patients, improving the quality of health services and improving patient satisfaction[11, 12]. In addition, recent studies have shown that general practitioners can moderate patients' trust and loyalty to doctors[13]. The impact of general practitioners on HSR is unclear.

Although the impact of general practitioners on the health system has been studied, there are few reports on the impact of general practitioners on HSR. Not to mention the role of general practitioners in the impact of the economy on HSR. Therefore, this study puts forward and verifies the hypothesis based on the previous research results. Whether the HSR of people in different towns with different economic levels will be different, and whether general practitioners play a moderation role in this difference.

2. Materials And Methods

2.1 Participants

We used a HSR survey conducted by the authors institute in Kunshan City, Jiangsu Province in 2019. After obtaining oral informed consent, face-to-face interviews were used to obtain data. In this study, we

adopted a multi-stage stratified random sampling scheme to ensure the representativeness of the sample. According to the population of Kunshan City and the proportion of people over 18 years old, we used Formula 1 to calculate the sample size. According to the estimation formula of random sampling samples, the allowable error shall not exceed 5(%) and the value is 0.05 as a standard test.

Formula 1:

$$n = \frac{N(Z_{\alpha/2})^2 \pi (1 - \pi)}{(N - 1) d^2 + (Z_{\alpha/2})^2 \pi (1 - \pi)}$$

The population in Kunshan city is 981,277, and the proportion of adult population over 18 years old is 61.4(%). Therefore, the sample size required for our study is 760. According to economic level of Kunshan City, we selected four towns: HQ, PL, ZP and JX. In the second stage, random sampling conducted according to the population proportion of each town. At the end of the study, 821 participants with normal cognition and ability to answer questions were included in the survey. One of them were excluded from the study because did not complete the survey. So in this study, the final sample of this study is 820 adults over the age of 18.

The school of public health and Health Administration Department of the authors institute were jointly responsible for the overall coordination of data and investigation. During the investigation period, each sample town will set up a special investigation group, with a specially assigned person responsible for the investigation work, carrying out homogenization training, investigation site management and check the completion of the questionnaire.

2.2 Measurement of General Practitioner Contract Services

The status of general practitioner contract services was a two-category variable. It was measured by the following yes–no question: “Did you contract with the family doctors?”, which could be respond with “yes” (coded = 1) or “no” (coded = 0)[11].

2.3 Measurement of HSR

To operationalize the concept of patient experience, the World Health Organization designed a framework of health system responsiveness [14]. The design of the questionnaire was based on the eight elements of the framework, including dignity, confidentiality, autonomy, communication, choice, prompt attention, basic amenities and social support (see Additional file 1). The respondents scored the questions of the eight elements of responsiveness according to their last outpatient experience, with 1 as the worst and 5 as the best. Therefore, the total score of our HSR questionnaire is 0–40. The higher the score, the higher the HSR. The Cronbach's α coefficient of the scale is 0.742. The KMO test value was found to be 0.887. The result of Barlett's Test of Sphericity was found to be $\chi^2 = 3125.552$, $P < 0.001$. The results of factor analysis showed that the common factor variance of all items was > 0.50 , and the accumulative variance

contribution of the two common factors was 67.105(%). The structural validity of the questionnaire is better.

2.4 Control Variables

The control variables in our study included age, gender, educational level, marital status, residential nature, chronic disease and hospital level. As for educational level, it was divided into primary school and below, junior middle school, senior high school and above. Marital status was divided into married, unmarried, divorced and widowed.

The residential nature was judged according to the length of residence. If the length of residence exceeds 6 months, it is defined as resident population, and if it is less than 6 months, it is defined as floating population[15].

For evidence of chronic disease was the diagnosis of chronic disease by a doctor or health professional. Measured by the question "Do you have a chronic disease confirmed by a doctor?". Respondents could answer "yes" or "no".

Regarding hospital level, it is measured by the question "Which hospital was your most recent visit?". Obtain the name of the hospital, we code it according to the hospital's current rating. (Tertiary hospital, coded = 1), (Secondary hospital, coded = 2), (Primary care institution, coded = 3).

2.5 Data Analysis

All data were analyzed using the SPSS 22.0 software. A P value < 0.05 (two-sided test) was considered statistically significant in the study. Mean and standard deviation (SD) were used to describe the continuous variables. Differences in demographic characteristics and general variables among the participate were examined using Analysis of Variance. Linear regression was applied to explore the association of people in different economic towns with HSR score, where the outcome variable was HSR score and the independent variable was economic level of residential towns. According to the results of univariate analysis and the research results considering others[16], we included gender, educational level, residential nature, chronic disease and hospital level as covariates in the model of multivariate analysis. What's more, this study used the macro Process version 3.2[17] to analyze the moderating effect of general practitioners in this relationship. EXCEL 2016 was used to draw a slope diagram to clearly show the moderating effect.

3. Results

3.1 Social-Demographic Characteristics of Participants

Finally, 820 participants were included in our study. Table 1 presents the demographic characteristics of the participants. Among the participants in the study, the mean age was 49.66 years, 351 were men, 663 had spouse and mean (SD) HSR score was 34.7 ± 4.29 . In addition, participants who are floating

population, have no chronic disease, utilization of health services in secondary hospitals, have no contracted general practitioner, from better economic towns tend to be have a lower HSR score ($P < 0.05$).

Table 1
Demographic characteristics of participants (N = 820)

	Total/ mean \pm SD	HSR score, mean \pm SD	F/χ^2	<i>P</i> -value
Age	49.66 \pm 18.87	34.7 \pm 4.29	1.01	0.4488
Gender			0.86	0.3542
Male	351	34.86 \pm 3.79		
Female	469	34.58 \pm 4.62		
Educational level			1.60	0.2035
Primary school and below	299	34.99 \pm 3.82		
Junior middle school	138	34.21 \pm 3.80		
Senior high school and above	383	34.65 \pm 4.76		
Marital status			1.59	0.1905
Unmarried	112	34.68 \pm 4.44		
Married	663	34.77 \pm 4.18		
Divorced	8	31.63 \pm 8.68		
Widowed	37	34.22 \pm 4.34		
Residential nature			3.01	0.0833
Resident population	605	34.85 \pm 4.22		
Floating population	215	34.27 \pm 4.44		
Chronic disease			5.46	0.0197
Yes	318	35.14 \pm 3.89		
No	502	34.42 \pm 4.50		
Hospital level			23.49	< 0.001
Tertiary hospital	137	33.89 \pm 4.58		
Secondary hospital	320	33.68 \pm 3.77		
Primary care institution	363	36.03 \pm 4.12		
General practitioner contract services			52.18	< 0.001
Yes	238	36.34 \pm 3.73		
No	582	34.03 \pm 4.32		

	Total/ mean \pm SD	HSR score, mean \pm SD	F/χ^2	<i>P</i> -value
Economic level of towns			24.85	< 0.001
Very poor	199	34.07 \pm 4.12		
Poor	257	36.51 \pm 4.65		
Well	208	33.58 \pm 3.72		
Very well	156	34.01 \pm 3.62		
Abbreviation: SD, standard deviation; HSR, health system responsiveness.				

3.2 Associations between towns and HSR score

By further analysis, using linear regression, we obtained the associations between towns and HSR score (Table 2). In step 1: adjusted for gender, educational level, residential nature, chronic disease and hospital level. Multivariate analysis showed that, gender, educational level, residential nature and chronic disease was still not statistically associated with HSR scores ($P > 0.05$). The association between economic development level of towns and HSR score was still significant ($\beta = -0.42$; 95% CI = -0.69-0.15; $p = 0.002$). In addition, hospital level ($\beta = 0.75$; 95% CI = 0.34–1.15; $p < 0.001$) and whether general practitioners are contracted ($\beta = 2.61$; 95% CI = 1.81–3.41; $p < 0.001$) were also important factors affecting the HSR score.

Table 2
Associations between economic level of towns and HSR score

Category	β	<i>P</i> -value	95%CI
Gender	-0.04	0.89	-0.62,0.54
Educational level	0.269	0.15	-0.10,0.64
Residential nature ^a	0.19	0.59	-0.49, 0.87
Chronic disease	-0.61	0.12	-1.38,0.16
Hospital level	0.75	< 0.01	0.34,1.15
General practitioner contract services	2.61	< 0.01	1.81,3.41
Economic level of towns	-0.42	0.002	-0.69,-0.15
Moderating effect	-	-	-
Note: Abbreviation: HSR, health system responsiveness; CI, confidence interval. ^a The residential nature was divided into resident population and floating population			

3.3. The Moderating Effect of General Practitioners

In step 2, we used model 1 in the macro PROCESS version 3.2 to take whether there is a contracted general practitioner as the moderating variable, the independent variable is the economic level of towns, the dependent variable is the HSR score, and the covariate is gender, educational level, residential nature, chronic disease and hospital level. Table 3 showed that, general practitioners significantly moderated the effect of economic level on HSR score ($P = 0.01$).

Table 3
The moderating effect of general practitioners

Category	β	p -value	95%CI
Gender	0.04	0.89	-0.62,0.54
Educational level	0.27	0.15	-0.10,0.64
Residential nature ^a	0.15	0.66	-0.53,0.83
Chronic disease	-0.64	0.09	-1.41,0.12
Hospital level	0.79	< 0.01	0.39,1.19
General practitioner contract services	2.66	< 0.01	1.87,3.46
Economic level of towns	-0.43	< 0.01	-0.70,-0.16
Moderating effect	-0.8	0.01	-1.40,-0.19
Note:			
Abbreviation: HSR, health system responsiveness; CI, confidence interval.			
^a The residential nature was divided into resident population and floating population			

As shown in Fig. 1, we can clearly obtain that the HSR score of people from towns with poor economic level are better, and the HSR score of people with general practitioners contract service are higher. More than that, the slope diagram (Fig. 1) and the coefficient value of the independent variable in Table 3, the general practitioner increased the impact of economic difference on the HSR score. However, it seems that this is good news, because general practitioners bring greater improvement to the HSR score of economically poor areas.

4. Discussion

Previous studies investigating the association between economic level and HSR. However, due to the limitations of research, some variables are rarely controlled, such as hospital level, general practitioner, education level and so on. In practice, these factors may greatly affect the results of HSR[16]. Therefore, we not only controlled the variables with significant differences in univariate analysis, but also considered the influence of relevant variables according to the previous literature. Our research shows

that, mean (SD) HSR score was 34.7 ± 4.29 , HSR scores of people in towns with different economic levels are different, and the towns with poor economy show better HSR. Moreover, hospital level and whether general practitioners are contracted were also important factors affecting the HSR score. General practitioners moderated the effect of economic level on HSR score. Policy and services designed to improve patient satisfaction, promote health equity and improve the quality of health services should recognize this issue and promote the importance of general practitioners in order to give full play to the role of primary health care institutions.

Significant effects of economic differences on HSR have also been found in other countries and regions[8, 18]. Consistent with previous findings, people with poor economic level show better HSR[19]. There is an explanation here, that is, people in economically poor areas have less contact with high-quality health services, so they have lower expectations for the health system. As a result, they are easier to be satisfied with the current health services and have higher health system responsiveness scores. Furthermore, this may reflected the fact that patients in the areas of poorer economic status often present to a community healthcare center or to a county or village hospital, whereas patients in the areas of better economic status will typically visit a higher level hospital where the large number of patients and complex admission process lead to the “three longs and a short” phenomenon: long registration time, long waiting time to see a doctor, long time waiting to be billed, and a short time spent seeing the doctor[9, 20]. Subsequently, people with a better economy showed worse HSR. On the other hand, our results also provided a relevant basis. The current health measures and strategies should focus on the distribution of medical resources in primary medical institutions and strengthen the combination of general practitioners and specialists, which can not only alleviate the resource burden of tertiary hospitals, but also improve the quality of primary medical services.

Similar to previous findings, our study also showed that the presence of general physicians improves HSR[21]. General physicians work closely with other specialists to provide quality services to contracted residents. Therefore, continuity of health services and coherence of information may affect HSR during patient admissions or referral services. There is also research showed that general physicians can provide chronic disease follow-up services and follow-up health services for post-discharge[10]. It not only promotes the communication between doctors and patients, but also makes patients feel respected. Moreover, general physicians can coordinate the medical service process, let patients actively participate in the medical process, improve patient autonomy, promote good communication between patients and health care providers, and thus they have better HSR scores[21]. In the process of improving HSR, it is difficult for us to control the relevant factors of the demand side of medical services, such as gender, age and education level. It is worth noting that, our results suggest that as a medical service provider, we can improve HSR from the perspective of providing general physicians.

Our results also illustrated that general physicians play a moderation role in the impact of economic level on HSR. In terms of the work tasks of general physicians in China, general physicians provide some basic services, including strengthening people's awareness of disease and health, chronic disease follow-up, medication guidance and convenient referral. However, the services provided by family doctors are basic

and limited, and those with good economic level may have better services in these aspects through medical insurance or private doctors. Therefore, compared with those with good economic level, the popularization of general physicians may be more suitable for those with poor economic level. Some previous studies on German's Disease Control Management Program and Accountable Care Organization in the United States also indicated that promoting communication between doctors and patients was the premise of integrated health care system, and general practitioners can achieve this goal to a certain extent[22, 23]. The current construction of health care system needs to strengthen the multidisciplinary primary health service team and establish a health service coordination mechanism with primary health care institutions as the core. The multidisciplinary team integrating general practitioners and specialists can better meet the needs of patient's management. Therefore, on the basis of ensuring medical quality, it is necessary to establish a standardized joint diagnosis and treatment mechanism of specialty and general practice, especially in those areas with poor economy. Through the work of general practitioners to better integrate primary health care institutions resources and improve HSR.

There were some limitations in our study, which hinder extrapolation as we only sampled survey on health system responsiveness in Kunshan City, China. However, although some previous articles have shown differences in HSR in countries with different economic levels, the results may not be completely reliable due to population sociocultural, ethnic, religious beliefs and other reasons. While our study narrowed the scope of the investigation, the results were more reliable. In addition, although the reliability and validity of the HSR questionnaire has been tested, the measurement standards of each country are different. In the future, in-depth research on the HSR questionnaire is needed to explore the scale suitable for each population, so as to obtain more accurate results. In addition, our study has inevitable recall bias, but we ensure the quality of the questionnaire through strict quality control.

5. Conclusion

Through multi-stage stratified sampling, it is observed that the economic development level of towns was negatively correlated with the increase of HSR score. That is, people in towns with good economic development level may have lower HSR scores. At the same time, general practitioners moderated the impact of economic development level on HSR score. The results provided a basis for improving the HSR, popularizing the family doctor system and improving the quality of health services.

List Of Abbreviations

HSR, health system responsiveness; GP, general practitioner; SD, standard deviation; CI, confidence interval.

Declarations

Ethics approval and consent to participate: The verbal informed consent was obtained from each participant prior to the survey and Academic Research Ethics Committee of Fudan University School of

Public Health confirmed this form of consent and approved the study protocol. The authors declare all methods were carried out in accordance with relevant guidelines and regulations.

Consent for publication: Not Applicable.

Availability of data and material: The datasets used and/or analysed during the current study available from the corresponding author on reasonable request.

Competing interests: The authors declare that they have no competing interests

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Authors' Contributions: All authors made substantial contributions to this study. Jing Lu conceived the idea. Zhuang Hong drafted the manuscript. Jun Lu provided important guidance on the writing and made great contributions in the process of revising. Gang Chen participated in the statistical collecting and data processing. Xiaohong Li, Mei Sun and Qi Tang provided relevant suggestions.

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Figures

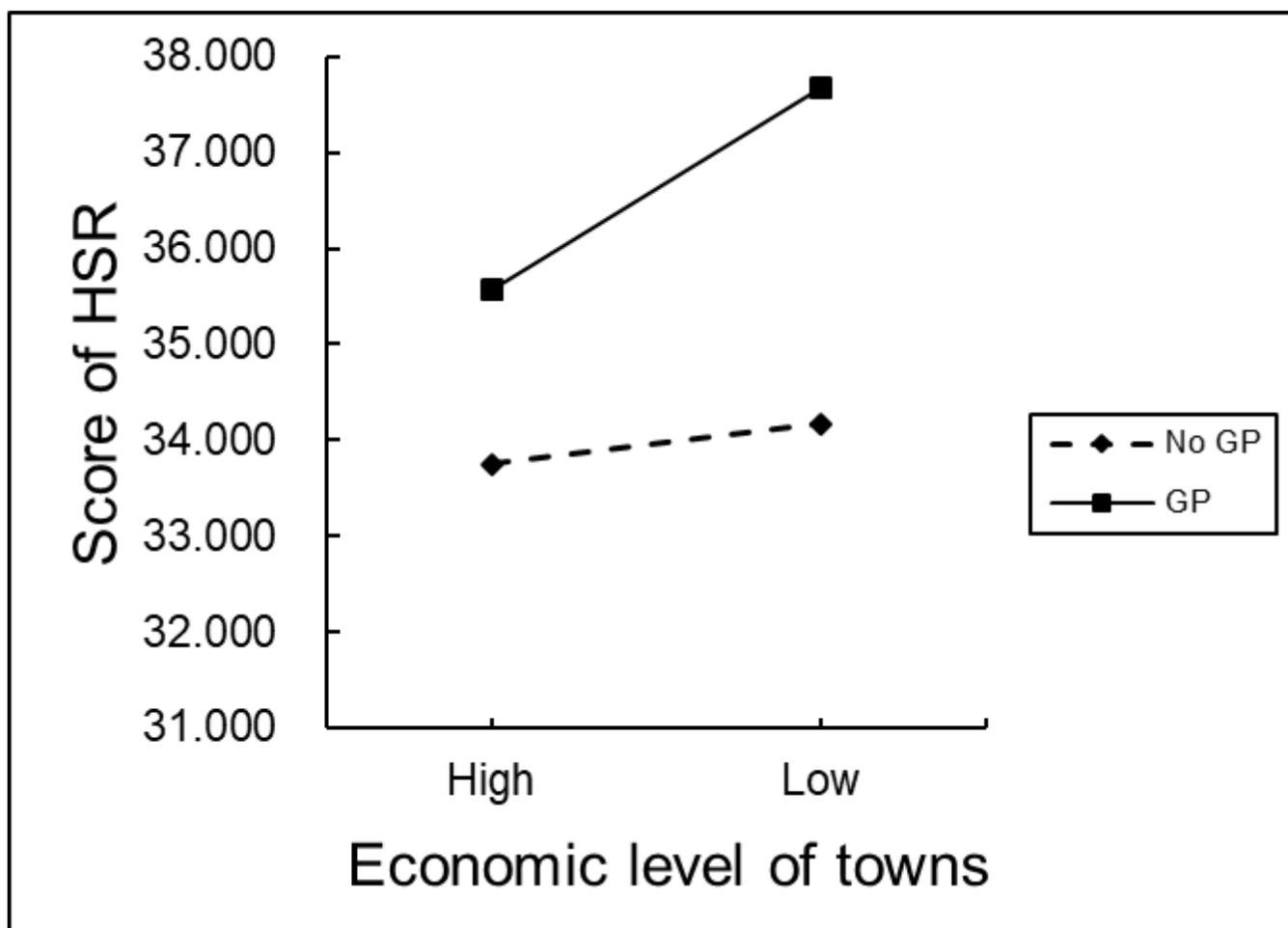


Figure 1

Slope diagram of general practitioner moderating effect

Note: HSR, health system responsiveness; GP, general practitioner.

Supplementary Files

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